



TN531 Series

High Precision GNSS Receiver

Introduction

Bivocom TN531 is a premium high-precision positioning unit for structural health monitoring, deformation analysis and disaster assessment. It features low power consumption, simple installation and broad environmental adaptability.

Built-in 4G and GNSS antenna enable steady real-time data transmission. IP68 waterproofing suits harsh scenarios; the integrated MEMS tilt sensor and 6-axis IMU optimize positioning precision via compensation correction.

Supporting RTK positioning and RTCM/RINEX protocols, it fits smart city deployment, bridge and dam structural health, geological disaster monitoring, landslide and flood surveillance. Equipped with RS232, RS485 and pulse input ports, it flexibly serves infrastructure and environmental monitoring.

TN531 enables accurate monitoring to boost safety and operational efficiency across urban and natural sites.

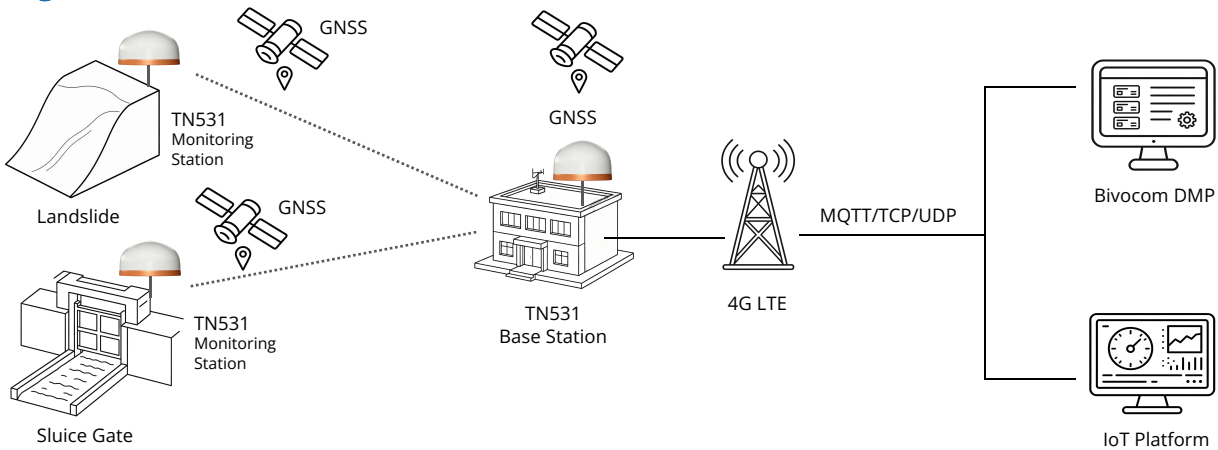
Key Features

- Multi high precision GNSS and RTK support
- 6-axis IMU for positioning compensation
- Built-in 4G+GNSS antennas with IP68, easy to deploy
- 1-RS232 (Debug), 1-RS485, 1-Pulse Input for diverse IoT sensors
- RTCM, RINEX protocols to improve the effectiveness and accuracy of GNSS

Applications

- Bridge
- Dam
- Reservoir
- Landslide
- Mining
- Building

Diagram



Specifications

Systems

CPU	Industrial 32-bit MCU
Flash	512KB
SRAM	256KB
Data Storage Flash	16MB

Cellular

Antenna	Built-in
SIM Slot	1 Nano SIM (4FF)

GNSS

Antenna	Built-in
GPS	GPS L1C/A /L1C/L2C/ L5
BDS	B1I/B2I/B1C/B2b/B2a/B3I
Galileo	E1/E5a/ E5b
GLONASS	G1/G2
QZSS	L1C/A/L1C/L2C/ L5

Accuracy

Static Accuracy	H: 2.5mm + 1ppm V: 5mm + 1ppm
RTK Accuracy	H: 8mm + 1ppm V: 15mm + 1ppm
Cold /Hot Start	≤18s / ≤1s
initialization Time	<5s
Reliability	>99.9%
PPS Accuracy	20ns

GNSS Data Output

Data Format	RTCM3.X, NMEA 0183 V4.1 (Optional)
Update Rate	10S (MAX: 1Hz)

MEMS IMU Sensor

6-Axis	3-axis gyroscope, 3-axis accelerometer for real-time compensated 3-axis attitude angles
Update Rate	Up to 20Hz

Serial

Ports	1 x RS232 (Debug), 1 x RS485
Baud Rate	300bps to 115200bps

I/O

Pulse Input	1 x PI (high level 5-35V)
Power Output	1 x 12VDC/1A

Power

Standard Power	12VDC/1.5A
Input Voltage	9-35 VDC
Working Mode	12V@145mA

Physical Characteristics

Ingress Protection	IP68
Housing & Weight	Aluminum alloy (base)+ABS/PC Cover, 1,550g (3.42lbs), without accessories
Dimensions	φ200*150mm
Mounting	Flange face, or pipe thread

Environmental

Operating Temp.	-35° C to +75° C (-31°F to +167°F)
Storage Temp.	-40° C to +80° C (-40°F to +176°F)
Relative Humidity	5% to 95% (non-condensing)

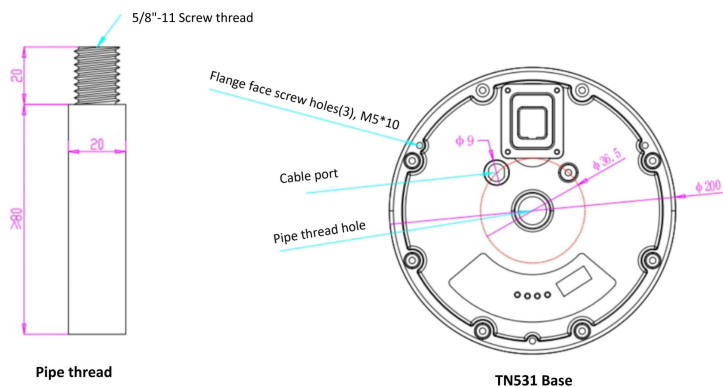
Others

LED Indicators	System, Online, Power, Error
Built-in	Watchdog, RTC, Timer
Approvals	NGS, CE*, RCM*, FCC*
Warranty Period	Standard: 2-Year limited warranty Extended: 3-5 Years

Software

Network Protocols	Modbus RTU, MQTT, Transparent TCP/UDP
Management	Config tool, SMS, Bivocom DMP*

Dimensions



Ordering Information

Model	Part Number	GNSS	4G Frequency Bands	Package Contents
TN531-LF	TN531-L<1>	GPS: L1C/A /L1C/L2C/ L5 BDS: B1I/B2I/B1C/B2b/B2a/B3I Galileo: E1/E5a/ E5b GLONASS: G1/G2 QZSS: L1C/A/L1C/L2C/ L5	4G LTE CAT 4* (Optional Global or Regional Version) • EMEA/Asia: B1/B3/B5/B7/B8/B20/B38/B40/B41 • ANZ/LATAM: B1/B3/B5/B7/B8/B28 • NA: B2/B4/B5/B12/B13/B14	1. TN531 x 1 2. 4 IN 1 Cable x 1 (Power in/out, RS232, RS485, PI) 3. Power cable x 1
Part Number: <1>: Cellular and GNSS module for different countries and regions				

- Note:**
1. Region-specific cellular modules are available; consult Bivocom sales for details.
 2. Bivocom DMP (Device Management Platform) requires a license fee.
 3. *Optional functions rely on matching hardware/firmware versions; not all features supported on one device.
 4. Power consumption is measured under laboratory conditions and is for reference only.
 5. *Listed certifications are pending.
 6. Extended warranty pricing varies.
 7. Digital user manuals are free to download from [Bivocom](#) official website for environmental protection.

About Bivocom

Founded in 2014, Bivocom specializes in industrial IoT communication technology. Our comprehensive product portfolio covers IoT sensors, cellular gateways, industrial routers, RTUs, modems, as well as self-developed IoT cloud management platforms. We deliver ruggedized industrial wireless hardware, full-lifecycle OEM/ODM customization services and end-to-end IoT connectivity one-stop solutions to industrial partners worldwide.

HQ: 27-28/F, Building F14, Software Park Phase III, Xiamen, 361022, China

W: [www.bivocom.com](#) P: +86 158 8026 2905
E: [sales@bivocom.com](#) E: [support@bivocom.com](#)

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